

CLAIMS

1. A wavelength division multiplexing optical transmission apparatus comprising:

5 an arrayed-waveguide grating having an output port and a plurality of input ports;
light emitting means for generating a pilot signal to be input to one of the input ports;
light detecting means for monitoring the pilot signal contained in a wavelength division
10 multiplexed signal output from the output port; and
a temperature control circuit for controlling the temperature of the arrayed-waveguide grating in such a manner as to cancel the amount of wavelength fluctuation occurring in the arrayed-waveguide
15 grating and detected by monitoring the pilot signal.

2. A wavelength division demultiplexing optical transmission apparatus comprising:

an arrayed-waveguide grating having an input port and a plurality of output ports;
20 light emitting means for generating a pilot signal to be input to the input port together with a wavelength division multiplexed signal;
light detecting means for monitoring the pilot signal output from one of the output ports; and
25 a temperature control circuit for controlling the temperature of the arrayed-waveguide grating in such a manner as to cancel the amount of wavelength fluctuation occurring in the arrayed-waveguide grating and detected by monitoring the pilot signal.

30 3. A wavelength division multiplexing optical transmission apparatus for transmitting a multiplexed signal carrying a first group of optical signals at different wavelengths, comprising:

an arrayed-waveguide grating having a
35 first output port from which is output the multiplexed signal carrying the first group of optical signals of different wavelengths respectively input from first to

Nth input ports, and a second output port from which is output a multiplexed signal carrying a second group of optical signals of different wavelengths respectively input from the first to Nth input ports;

5 light emitting means for applying a pilot signal having a wavelength belonging to the second group of optical signals to a corresponding one of the input ports;

10 light detecting means for monitoring the pilot signal output from the second output port; and
 a temperature control circuit for controlling the temperature of the arrayed-waveguide grating in such a manner as to cancel the amount of wavelength fluctuation occurring in the arrayed-waveguide grating and detected by monitoring the pilot signal.

15 4. A wavelength division multiplexing optical transmission apparatus as claimed in any one of claims 1 to 3, wherein

20 the light emitting means is a wavelength tunable light source having a wavelength locker function, and generates signal light whose wavelength is swept within the bandwidth of the port at which the pilot signal is input, and

25 the light detecting means detects the amount of fluctuation in the filter characteristics of the port by detecting the swept signal light.

 5. A wavelength division multiplexing optical transmission apparatus as claimed in any one of claims 1 to 3, wherein

30 the light emitting means comprises a plurality of light sources, and

 the light detecting means detects the amount of fluctuation in the filter characteristics of the port at which the pilot signal is input, by comparing
35 received light levels between the plurality of light sources.